CY7C132/CY7C136
CY7C142/CY7C146

2Kx8 Dual-Port Static RAM

Features

- **True Dual-Ported memory cells which allow simultaneous reads of the same memory location**
- **2K x 8 organization**
- **0.65-micron CMOS for optimum speed/power**
- **High-speed access: 15 ns**
- **Low operating power: I_{CC} = 110 mA (max.)**
- **Fully asynchronous operation**
- **Automatic power-down**
- **Master CY7C132/CY7C136 easily expands data bus width to 16 or more bits using slave CY7C142/CY7C146**
- **$\overline{BUSY}$ output flag on CY7C132/CY7C136; $\overline{BUSY}$ input on CY7C142/CY7C146**
- **$\overline{INT}$ flag for port-to-port communication (52-pin PLCC/PQFP versions)**
- **Available in 48-pin DIP (CY7C132/142), 52-pin PLCC and 52-pin TQFP (CY7C136/146)**
- **Pin-compatible and functionally equivalent to IDT7132/IDT7142**

Functional Description

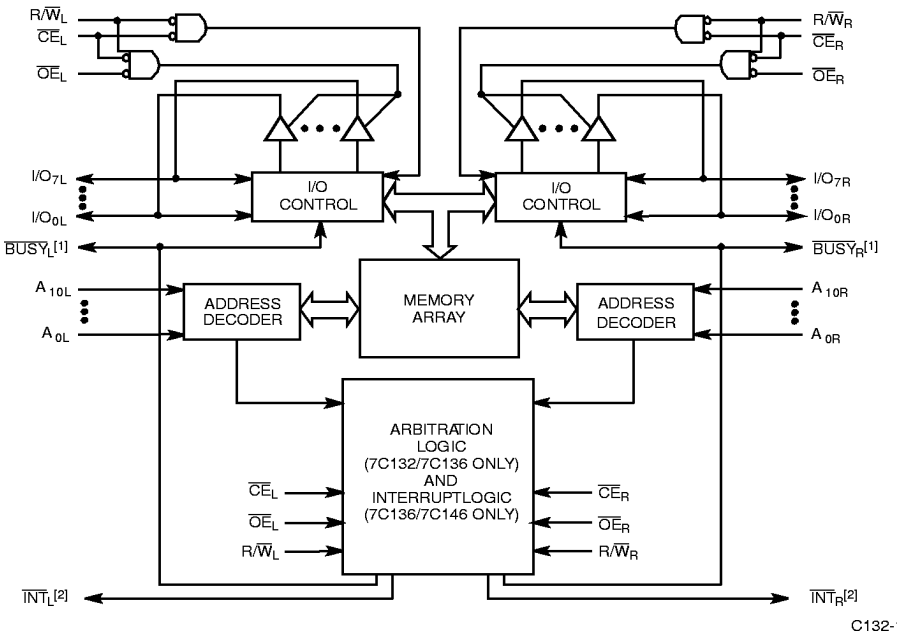
The CY7C132/CY7C136/CY7C142 and CY7C146 are high-speed CMOS 2K by 8 dual-port static RAMs. Two ports are provided to permit independent access to any location in memory. The CY7C132/ CY7C136 can be utilized as either a standalone 8-bit dual-port static RAM or as a MASTER dual-port RAM in conjunction with the CY7C142/CY7C146 SLAVE dual-port device in systems requiring 16-bit or greater word widths. It is the solution to applications requiring shared or buffered data such as cache memory for DSP, bit-slice, or multiprocessor designs.

Each port has independent control pins; chip enable ($\overline{CE}$), write enable (R/$\overline{W}$), and output enable ($\overline{OE}$). $\overline{BUSY}$ flags are provided on each port. In addition, an interrupt flag ($\overline{INT}$) is provided on each port of the 52-pin PLCC version. $\overline{BUSY}$ signals that the port is trying to access the same location currently being accessed by the other port. On the PLCC version, $\overline{INT}$ is an interrupt flag indicating that data has been placed in a unique location (7FF for the left port and 7FE for the right port).

An automatic power-down feature is controlled independently on each port by the chip enable ($\overline{CE}$) pins.

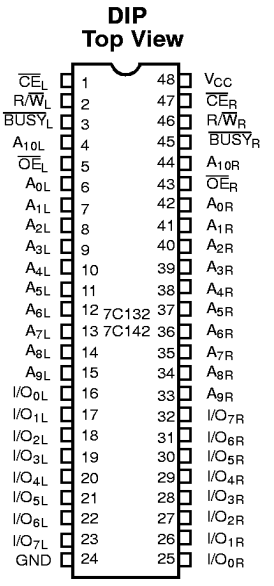
The CY7C132/CY7C142 are available in 48-pin DIP. The CY7C136/CY7C146 are available in 52-pin PLCC and PQFP.

Logic Block Diagram



C132-1

Pin Configuration



C132-2

Notes:

1. CY7C132/CY7C136 (Master): BUSY is open drain output and requires pull-up resistor.
   CY7C142/CY7C146 (Slave): BUSY is input.
2. Open drain outputs; pull-up resistor required.

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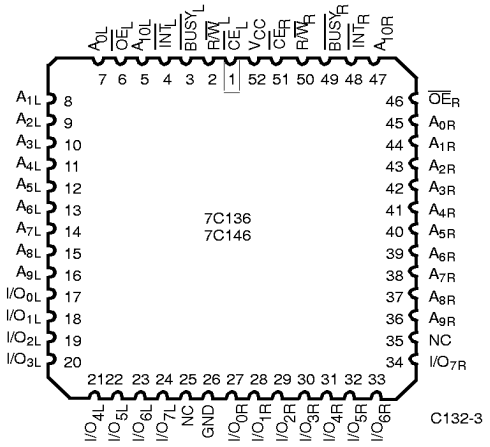
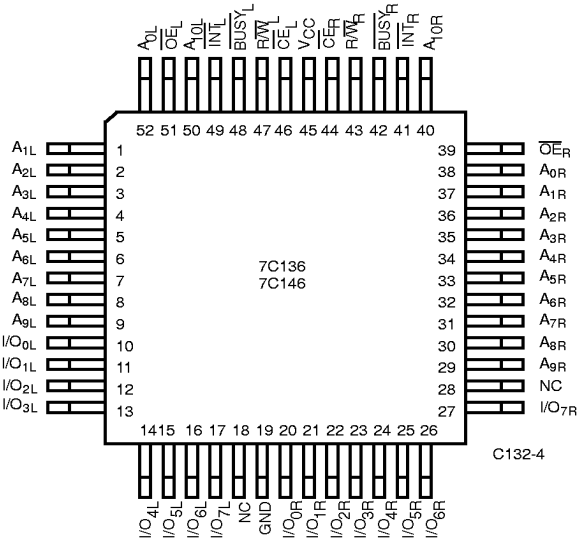
December 1989 – Revised May 29, 1997

Pin Configurations (continued)

PLCC
Top View



PQFP
Top View



Selection Guide

		7C136-15[3,4] 7C146-15	7C132-25[3] 7C136-25 7C142-25 7C146-25	7C132-30 7C136-30 7C142-30 7C146-30	7C132-35 7C136-35 7C142-35 7C146-35	7C132-45 7C136-45 7C142-45 7C146-45	7C132-55 7C136-55 7C142-55 7C146-55
Maximum Access Time (ns)		15	25	30	35	45	55
Maximum Operating Current (mA)	Com'l/Ind	190	170	170	120	120	110
Maximum Operating Current (mA)	Military				170	170	120
Maximum Standby Current (mA)	Com'l/Ind	75	65	65	45	45	35
	Military				65	65	45

Shaded area contains preliminary information.

Notes:

3. 15 and 25-ns version available in PQFP and PLCC packages only.
4. Shaded area contains preliminary information.

Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature ..... –65°C to +150°C

Ambient Temperature with Power Applied..... –55°C to +125°C

Supply Voltage to Ground Potential (Pin 48 to Pin 24)..... –0.5V to +7.0V

DC Voltage Applied to Outputs in High Z State..... –0.5V to +7.0V

DC Input Voltage ..... –3.5V to +7.0V

Output Current into Outputs (LOW) ..... 20 mA

Static Discharge Voltage ..... >2001V (per MIL-STD-883, Method 3015)

Latch-Up Current ..... >200 mA

Operating Range

Range	Ambient Temperature	V_{CC}
Commercial	0°C to +70°C	5V ± 10%
Industrial	–40°C to +85°C	5V ± 10%
Military[5]	–55°C to +125°C	5V ± 10%

Note:

5. T_A is the "instant on" case temperature.

Electrical Characteristics Over the Operating Range[6]

Parameter	Description	Test Conditions		7C136-15[3,4] 7C146-15		7C132-30[3] 7C136-25,30 7C142-30 7C146-25,30		7C132-35,45 7C136-35,45 7C142-35,45 7C146-35,45		7C132-55 7C136-55 7C142-55 7C146-55		Unit
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
V_{OH}	Output HIGH Voltage	V_{CC} = Min., I_{OH} = -4.0 mA		2.4		2.4		2.4		2.4		V
V_{OL}	Output LOW Voltage	I_{OL} = 4.0 mA			0.4		0.4		0.4		0.4	V
		I_{OL} = 16.0 mA[7]			0.5		0.5		0.5		0.5	
V_{IH}	Input HIGH Voltage			2.2		2.2		2.2		2.2		V
V_{IL}	Input LOW Voltage				0.8		0.8		0.8		0.8	V
I_{IX}	Input Load Current	GND ≤ V_I ≤ V_{CC}		-5	+5	–5	+5	–5	+5	–5	+5	µA
I_{OZ}	Output Leakage Current	GND ≤ V_O ≤ V_{CC}, Output Disabled		-5	+5	–5	+5	–5	+5	–5	+5	µA
I_{OS}	Output Short Circuit Current[8]	V_{CC} = Max., V_{OUT} = GND			-350		–350		–350		–350	mA
I_{CC}	V_{CC} Operating Supply Current	$\overline{CE}$ = V_{IL}, Outputs Open, f = f_{MAX}[9]	Com'l		190		170		120		110	mA
			Mil						170		120	
I_{SB1}	Standby Current Both Ports, TTL Inputs	$\overline{CE}_L$ and $\overline{CE}_R$ ≥ V_{IH}, f = f_{MAX}[9]	Com'l		75		65		45		35	mA
			Mil						65		45	
I_{SB2}	Standby Current One Port, TTL Inputs	$\overline{CE}_L$ or $\overline{CE}_R$ ≥ V_{IH}, Active Port Outputs Open, f = f_{MAX}[9]	Com'l		135		115		90		75	mA
			Mil						115		90	
I_{SB3}	Standby Current Both Ports, CMOS Inputs	Both Ports $\overline{CE}_L$ and $\overline{CE}_R$ ≥ V_{CC} – 0.2V, V_{IN} ≥ V_{CC} – 0.2V or V_{IN} ≤ 0.2V, f = 0	Com'l		15		15		15		15	mA
			Mil						15		15	
I_{SB4}	Standby Current One Port, CMOS Inputs	One Port $\overline{CE}_L$ or $\overline{CE}_R$ ≥ V_{CC} – 0.2V, V_{IN} ≥ V_{CC} – 0.2V or V_{IN} ≤ 0.2V, Active Port Outputs Open, f = f_{MAX}[9]	Com'l		125		105		85		70	mA
			Mil						105		85	

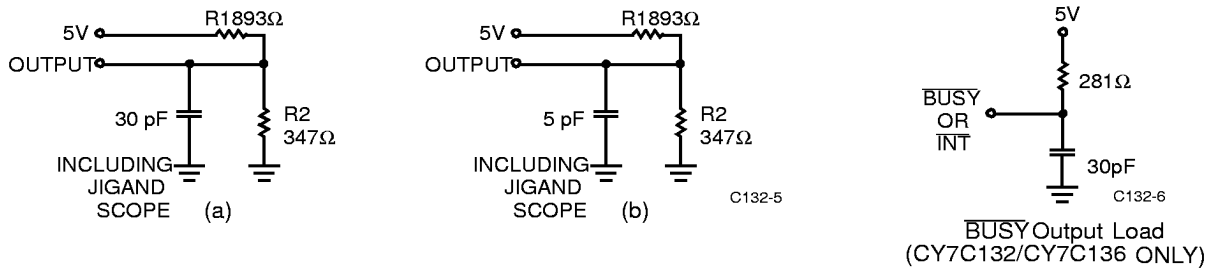
Shaded area contains preliminary information.

Capacitance[10]

Parameter	Description	Test Conditions	Max.	Unit
C_{IN}	Input Capacitance	T_A = 25°C, f = 1 MHz, V_{CC} = 5.0V	15	pF
C_{OUT}	Output Capacitance		10	pF

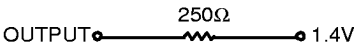
Notes:
6. See the last page of this specification for Group A subgroup testing information.
7. $\overline{BUSY}$ and $\overline{INT}$ pins only.
8. Duration of the short circuit should not exceed 30 seconds.
9. At f=f_{MAX}, address and data inputs are cycling at the maximum frequency of read cycle of 1/t_{rc} and using AC Test Waveforms input levels of GND to 3V.
10. This parameter is guaranteed but not tested.

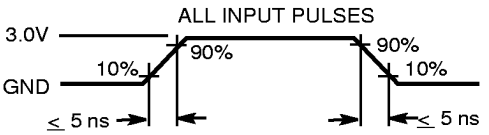
AC Test Loads and Waveforms



BUSY Output Load
(CY7C132/CY7C136 ONLY)

Equivalent to: THVÉNIN EQUIVALENT





Switching Characteristics Over the Operating Range[6, 11]

Parameter	Description	7C136-15[3,4] 7C146-15		7C132-25[3] 7C136-25 7C142-25 7C146-25		7C132-30 7C136-30 7C142-30 7C146-30		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
READ CYCLE								
t_{RC}	Read Cycle Time	15		25		30		ns
t_{AA}	Address to Data Valid[12]		15		25		30	ns
t_{OHA}	Data Hold from Address Change	0		0		0		ns
t_{ACE}	$\overline{CE}$ LOW to Data Valid[12]		15		25		30	ns
t_{DOE}	$\overline{OE}$ LOW to Data Valid[12]		10		15		20	ns
t_{LZOE}	$\overline{OE}$ LOW to Low Z[10, 13]	3		3		3		ns
t_{HZOE}	$\overline{OE}$ HIGH to High Z[10, 13, 14]		10		15		15	ns
t_{LZCE}	$\overline{CE}$ LOW to Low Z[10, 13]	3		5		5		ns
t_{HZCE}	$\overline{CE}$ HIGH to High Z[10, 13, 14]		10		15		15	ns
t_{PU}	$\overline{CE}$ LOW to Power-Up[10]	0		0		0		ns
t_{PD}	$\overline{CE}$ HIGH to Power-Down[10]		15		25		25	ns
WRITE CYCLE[15]								
t_{WC}	Write Cycle Time	15		25		30		ns
t_{SCE}	$\overline{CE}$ LOW to Write End	12		20		25		ns
t_{AW}	Address Set-Up to Write End	12		20		25		ns
t_{HA}	Address Hold from Write End	2		2		2		ns
t_{SA}	Address Set-Up to Write Start	0		0		0		ns
t_{PWE}	R/$\overline{W}$ Pulse Width	12		15		25		ns
t_{SD}	Data Set-Up to Write End	10		15		15		ns
t_{HD}	Data Hold from Write End	0		0		0		ns
t_{HZWE}	R/$\overline{W}$ LOW to High Z[10]		10		15		15	ns
t_{LZWE}	R/$\overline{W}$ HIGH to Low Z[10]	0		0		0		ns

Switching Characteristics Over the Operating Range[6, 11] (continued)

Parameter	Description	7C136-15[3,4] 7C146-15		7C132-25[3] 7C136-25 7C142-25 7C146-25		7C132-30 7C136-30 7C142-30 7C146-30		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
BUSY/INTERRUPT TIMING								
t_{BLA}	$\overline{BUSY}$ LOW from Address Match		15		20		20	ns
t_{BHA}	$\overline{BUSY}$ HIGH from Address Mismatch[16]		15		20		20	ns
t_{BLC}	$\overline{BUSY}$ LOW from $\overline{CE}$ LOW		15		20		20	ns
t_{BHC}	$\overline{BUSY}$ HIGH from $\overline{CE}$ HIGH[16]		15		20		20	ns
t_{PS}	Port Set Up for Priority	5		5		5		ns
t_{WB}	R/$\overline{W}$ LOW after $\overline{BUSY}$ LOW[17]	0		0		0		ns
t_{WH}	R/$\overline{W}$ HIGH after $\overline{BUSY}$ HIGH	13		20		30		ns
t_{BDD}	$\overline{BUSY}$ HIGH to Valid Data		15		25		30	ns
t_{DDD}	Write Data Valid to Read Data Valid		Note 18		Note 18		Note 18	ns
t_{WDD}	Write Pulse to Data Delay		Note 18		Note 18		Note 18	ns
INTERRUPT TIMING[19]								
t_{WINS}	R/$\overline{W}$ to $\overline{INTERRUPT}$ Set Time		15		25		25	ns
t_{EINS}	$\overline{CE}$ to $\overline{INTERRUPT}$ Set Time		15		25		25	ns
t_{INS}	Address to $\overline{INTERRUPT}$ Set Time		15		25		25	ns
t_{OINR}	$\overline{OE}$ to $\overline{INTERRUPT}$ Reset Time[16]		15		25		25	ns
t_{EINR}	$\overline{CE}$ to $\overline{INTERRUPT}$ Reset Time[16]		15		25		25	ns
t_{INR}	Address to $\overline{INTERRUPT}$ Reset Time[16]		15		25		25	ns

Shaded area contains preliminary information.

Switching Characteristics Over the Operating Range[6, 11]

Parameter	Description	7C132-35 7C136-35 7C142-35 7C146-35		7C132-45 7C136-45 7C142-45 7C146-45		7C132-55 7C136-55 7C142-55 7C146-55		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
READ CYCLE								
t_{RC}	Read Cycle Time	35		45		55		ns
t_{AA}	Address to Data Valid[12]		35		45		55	ns
t_{OHA}	Data Hold from Address Change	0		0		0		ns
t_{ACE}	$\overline{CE}$ LOW to Data Valid[12]		35		45		55	ns
t_{DOE}	$\overline{OE}$ LOW to Data Valid[12]		20		25		25	ns
t_{LZOE}	$\overline{OE}$ LOW to Low Z[10, 13]	3		3		3		ns
t_{HZOE}	$\overline{OE}$ HIGH to High Z[10, 13, 14]		20		20		25	ns
t_{LZCE}	$\overline{CE}$ LOW to Low Z[10, 13]	5		5		5		ns
t_{HZCE}	$\overline{CE}$ HIGH to High Z[10, 13, 14]		20		20		25	ns
t_{PU}	$\overline{CE}$ LOW to Power-Up[10]	0		0		0		ns
t_{PD}	$\overline{CE}$ HIGH to Power-Down[10]		35		35		35	ns

Switching Characteristics Over the Operating Range[6, 11] (continued)

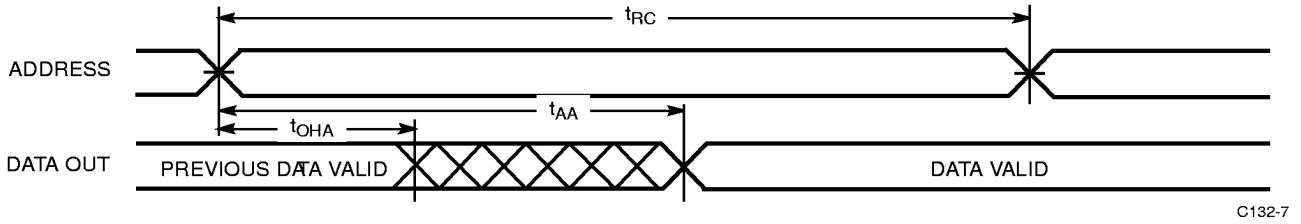
		7C132-35 7C136-35 7C142-35 7C146-35		7C132-45 7C136-45 7C142-45 7C146-45		7C132-55 7C136-55 7C142-55 7C146-55		
WRITE CYCLE[15]								
t_{WC}	Write Cycle Time	35		45		55		ns
t_{SCE}	$\overline{CE}$ LOW to Write End	30		35		40		ns
t_{AW}	Address Set-Up to Write End	30		35		40		ns
t_{HA}	Address Hold from Write End	2		2		2		ns
t_{SA}	Address Set-Up to Write Start	0		0		0		ns
t_{PWE}	R/$\overline{W}$ Pulse Width	25		30		30		ns
t_{SD}	Data Set-Up to Write End	15		20		20		ns
t_{HD}	Data Hold from Write End	0		0		0		ns
t_{HZWE}	R/$\overline{W}$ LOW to High Z[10]		20		20		25	ns
t_{LZWE}	R/$\overline{W}$ HIGH to Low Z[10]	0		0		0		ns
BUSY/INTERRUPT TIMING								
t_{BLA}	$\overline{BUSY}$ LOW from Address Match		20		25		30	ns
t_{BHA}	$\overline{BUSY}$ HIGH from Address Mismatch[16]		20		25		30	ns
t_{BLC}	$\overline{BUSY}$ LOW from $\overline{CE}$ LOW		20		25		30	ns
t_{BHC}	$\overline{BUSY}$ HIGH from $\overline{CE}$ HIGH[16]		20		25		30	ns
t_{PS}	Port Set Up for Priority	5		5		5		ns
t_{WB}	R/$\overline{W}$ LOW after $\overline{BUSY}$ LOW[17]	0		0		0		ns
t_{WH}	R/$\overline{W}$ HIGH after $\overline{BUSY}$ HIGH	30		35		35		ns
t_{BDD}	$\overline{BUSY}$ HIGH to Valid Data		35		45		45	ns
t_{DDD}	Write Data Valid to Read Data Valid		Note 18		Note 18		Note 18	ns
t_{WDD}	Write Pulse to Data Delay		Note 18		Note 18		Note 18	ns
INTERRUPT TIMING[19]								
t_{WINS}	R/$\overline{W}$ to $\overline{INTERRUPT}$ Set Time		25		35		45	ns
t_{EINS}	$\overline{CE}$ to $\overline{INTERRUPT}$ Set Time		25		35		45	ns
t_{INS}	Address to $\overline{INTERRUPT}$ Set Time		25		35		45	ns
t_{OINR}	$\overline{OE}$ to $\overline{INTERRUPT}$ Reset Time[16]		25		35		45	ns
t_{EINR}	$\overline{CE}$ to $\overline{INTERRUPT}$ Reset Time[16]		25		35		45	ns
t_{INR}	Address to $\overline{INTERRUPT}$ Reset Time[16]		25		35		45	ns

Notes:

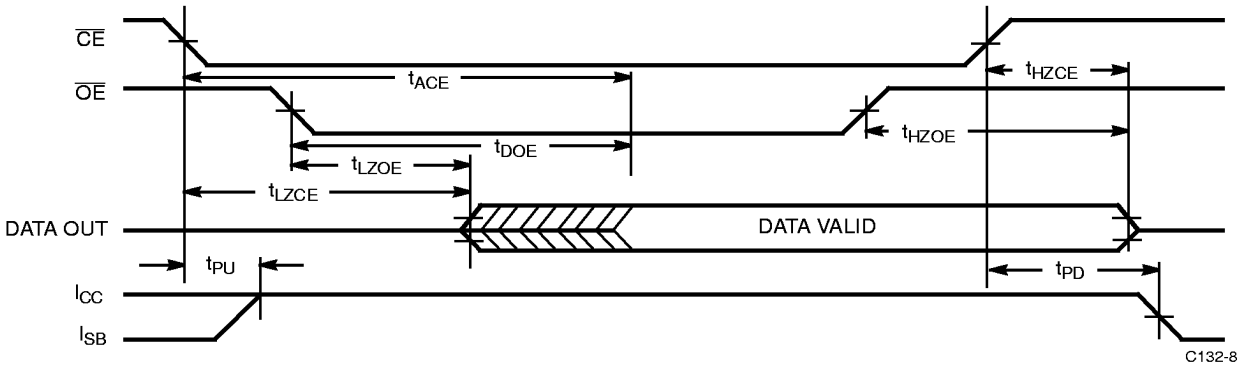
11. Test conditions assume signal transition times of 5 ns or less, timing reference levels of 1.5V, input pulse levels of 0 to 3.0V and output loading of the specified I_{OL}/I_{OH} and 30-pF load capacitance.
12. AC test conditions use $V_{OH} = 1.6V$ and $V_{OL} = 1.4V$.
13. At any given temperature and voltage condition for any given device, t_{HZCE} is less than t_{LZCE} and t_{HZOE} is less than t_{LZOE}.
14. t_{LZCE}, t_{LZWE}, t_{HZOE}, t_{LZOE}, t_{HZCE}, and t_{HZWE} are tested with $C_L = 5pF$ as in part (b) of AC Test Loads. Transition is measured ±500 mV from steady-state voltage.
15. The internal write time of the memory is defined by the overlap of $\overline{CE}$ LOW and R/$\overline{W}$ LOW. Both signals must be LOW to initiate a write and either signal can terminate a write by going HIGH. The data input setup and hold timing should be referenced to the rising edge of the signal that terminates the write.
16. These parameters are measured from the input signal changing, until the output pin goes to a high-impedance state.
17. CY7C142/CY7C146 only.
18. A write operation on Port A, where Port A has priority, leaves the data on Port B's outputs undisturbed until one access time after one of the following:
    $\overline{BUSY}$ on Port B goes HIGH.
    Port B's address toggled.
    $\overline{CE}$ for Port B is toggled.
    R/$\overline{W}$ for Port B is toggled during valid read.
19. 52-pin PLCC and PQFP versions only.

Switching Waveforms

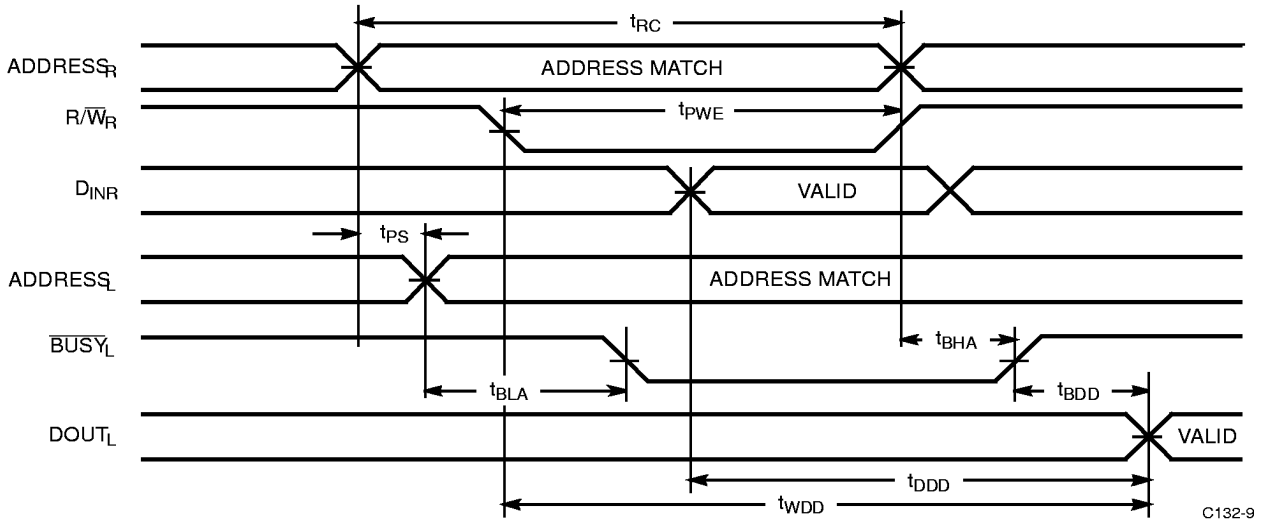
Read Cycle No. 1 (Either Port-Address Access)[20, 21]



Read Cycle No. 2 (Either Port-$\overline{CE}$/$\overline{OE}$)[20, 22]



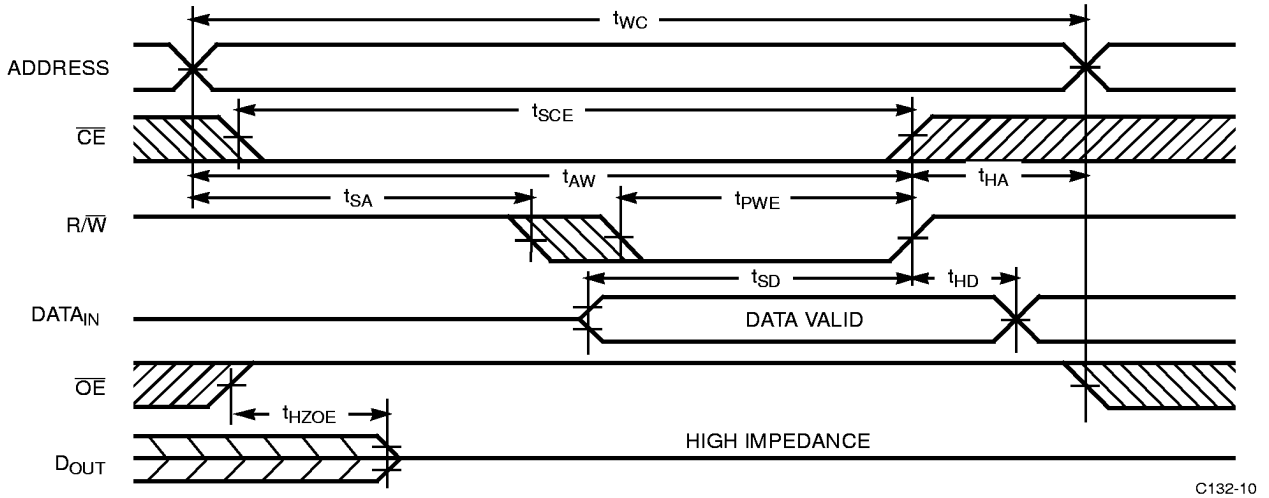
Read Cycle No. 3 (Read with $\overline{BUSY}$ Master: CY7C132 and CY7C136)



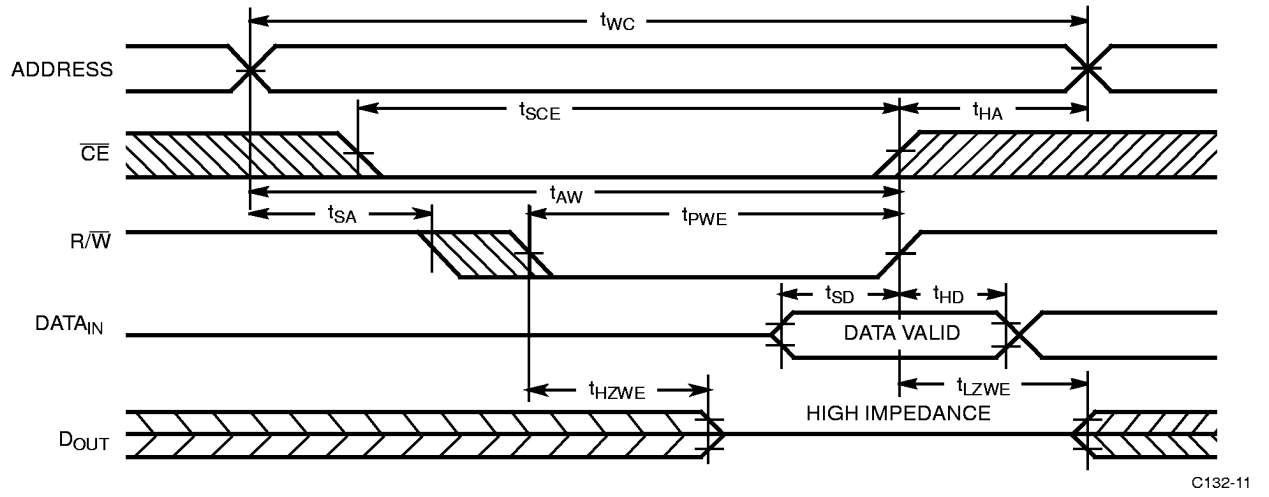
Notes:
20. R/$\overline{W}$ is HIGH for read cycle.
21. Device is continuously selected, $\overline{CE} = V_{IL}$ and $\overline{OE} = V_{IL}$.
22. Address valid prior to or coincident with $\overline{CE}$ transition LOW.

Switching Waveforms (continued)

Write Cycle No.1 ($\overline{OE}$ Three-States Data I/Os-Either Port)[15, 23]



Write Cycle No. 2 (R/$\overline{W}$ Three–States Data I/Os-Either Port)[15, 24]



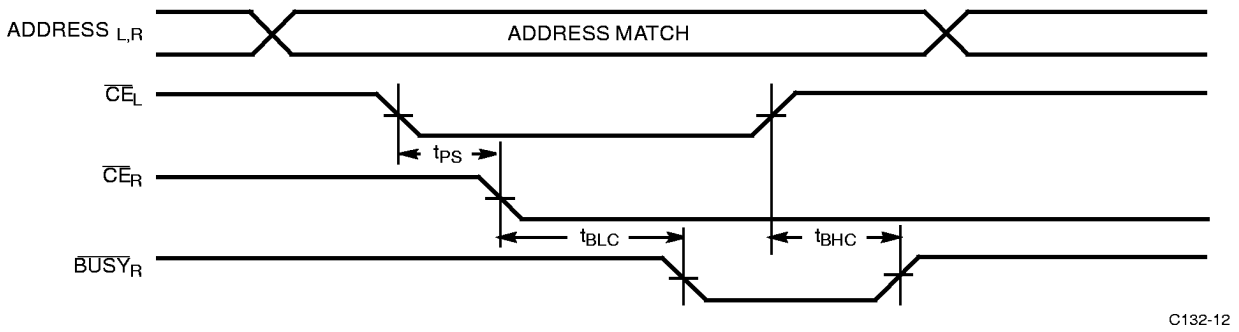
Notes:

23. If $\overline{OE}$ is LOW during a R/$\overline{W}$ controlled write cycle, the write pulse width must be the larger of t_{PWE} or $t_{HZWE} + t_{SD}$ to allow the data I/O pins to enter high impedance and for data to be placed on the bus for the required t_{SD}.
24. If the $\overline{CE}$ LOW transition occurs simultaneously with or after the R/$\overline{W}$ LOW transition, the outputs remain in a high-impedance state.

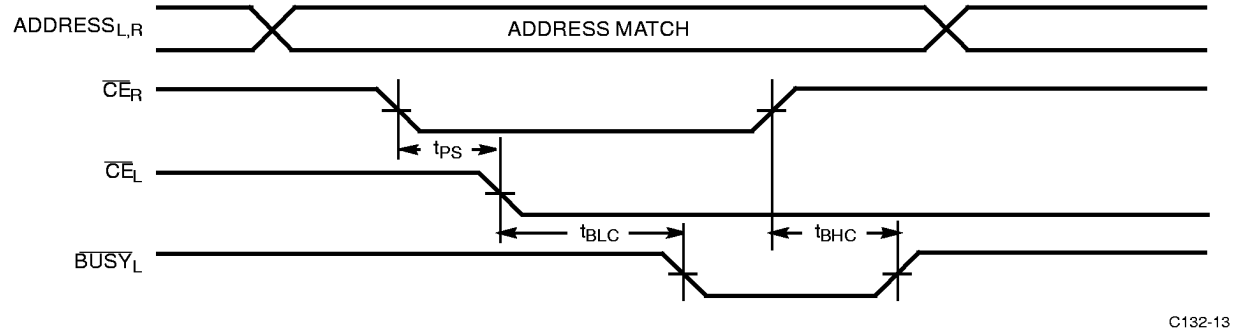
Switching Waveforms (continued)

Busy Timing Diagram No. 1 ($\overline{CE}$ Arbitration)

$\overline{CE}_L$ Valid First:

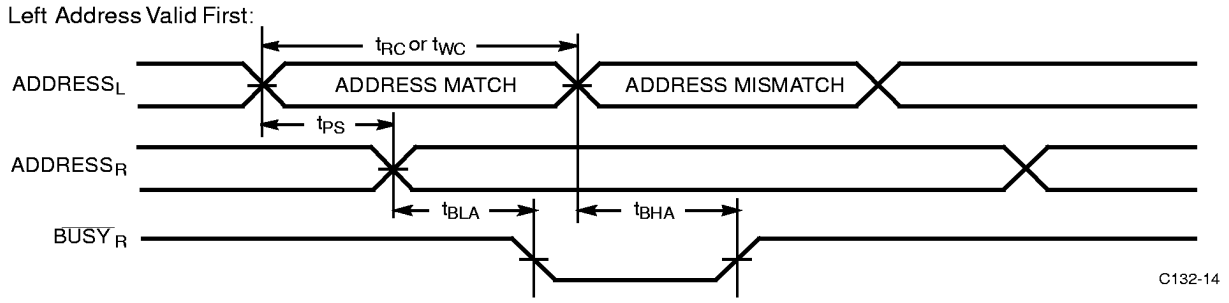


$\overline{CE}_R$ Valid First:

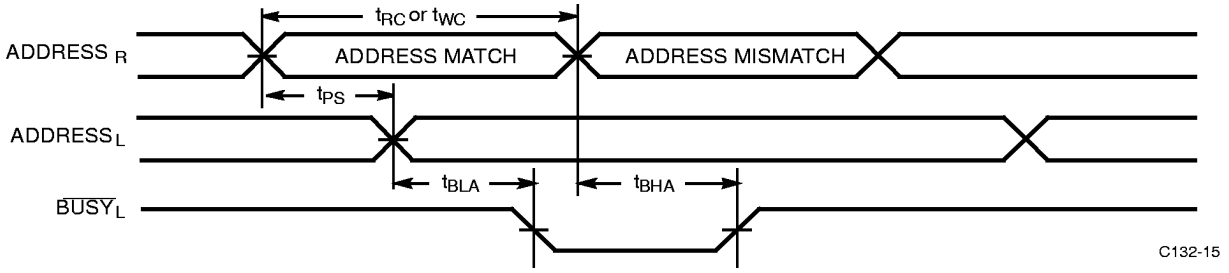


Busy Timing Diagram No. 2 (Address Arbitration)

Left Address Valid First:

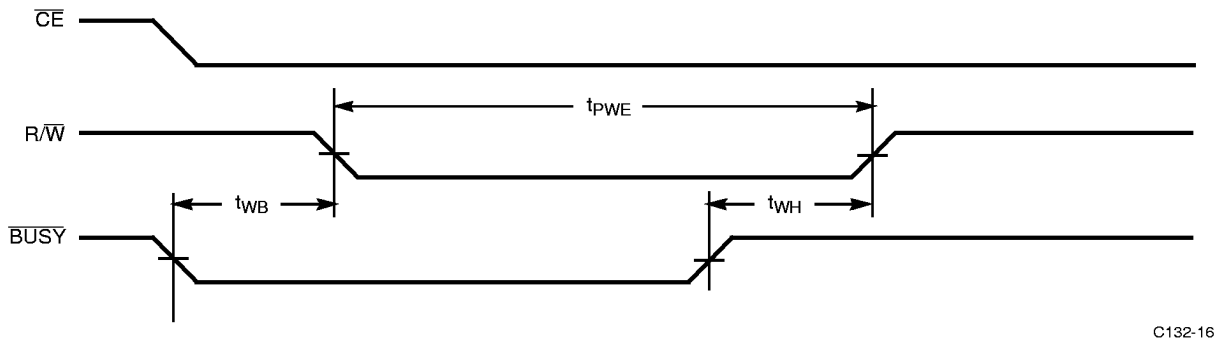


Right Address Valid First:



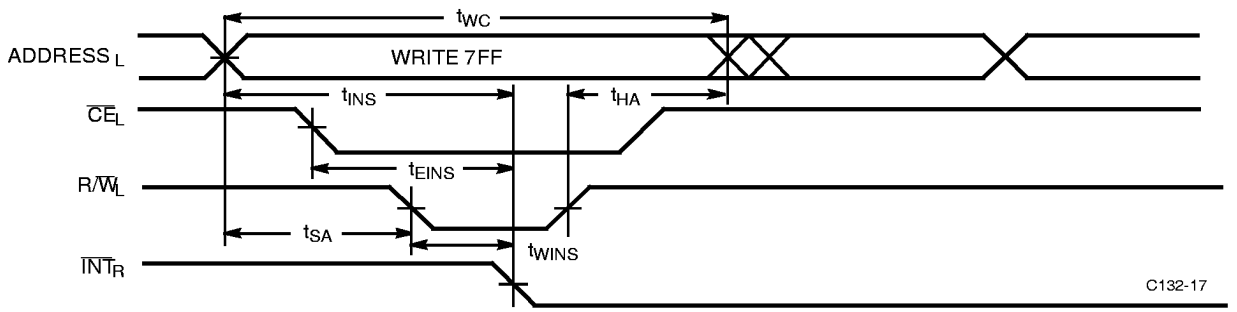
Switching Waveforms (continued)

Busy Timing Diagram No. 3 (Write with $\overline{BUSY}$, Slave: CY7C142/CY7C146)

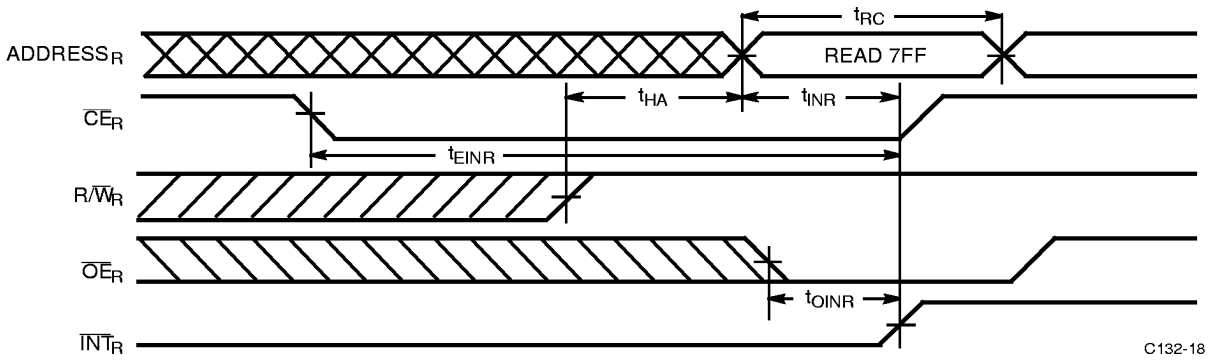


Interrupt Timing Diagrams[19]

Left Side Sets $\overline{INT}_R$:

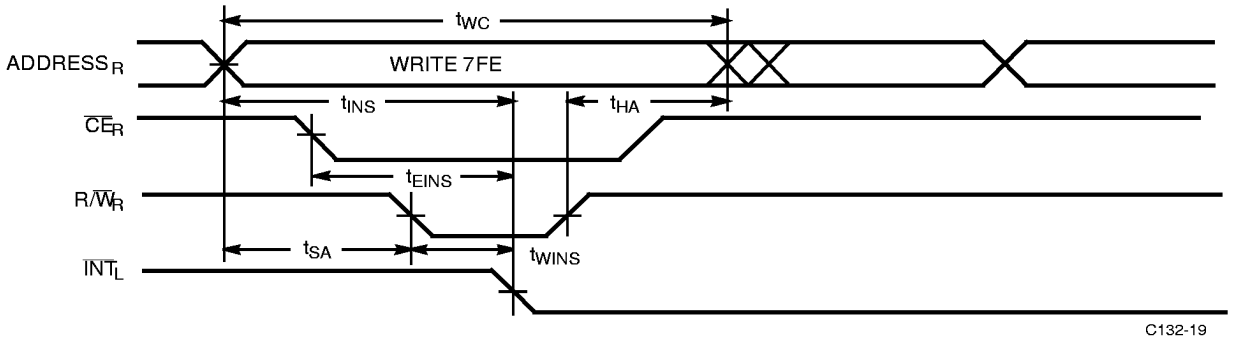


Right Side Clears $\overline{INT}_R$:

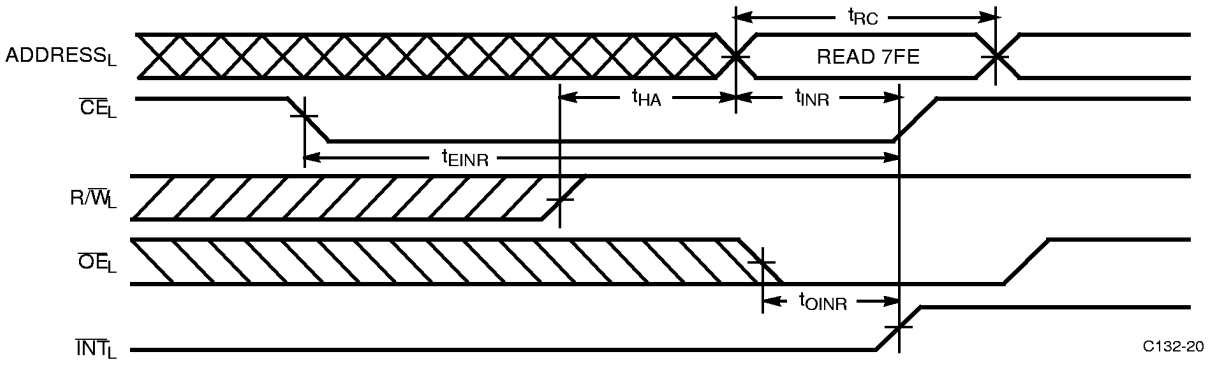


Interrupt Timing Diagrams[19] (continued)

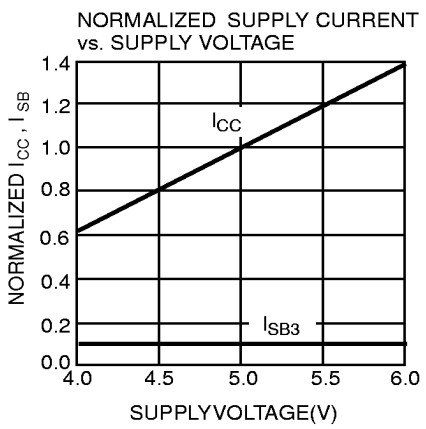
Right Side Sets $\overline{INT}_L$:

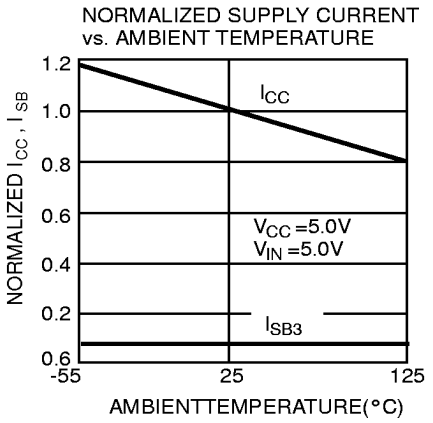


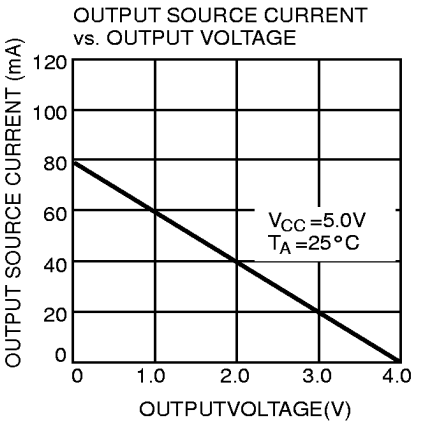
Right Side Clears $\overline{INT}_L$:

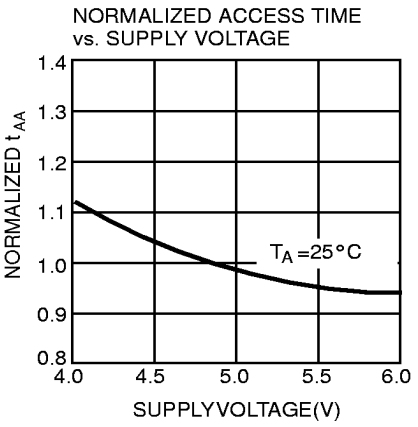


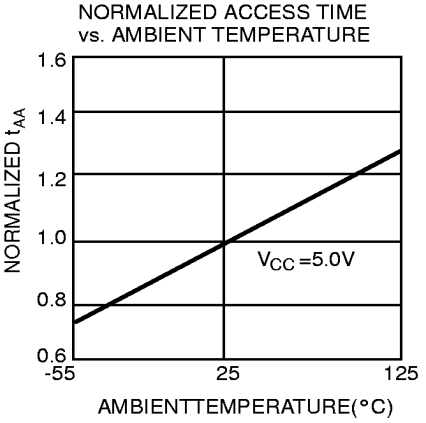
Typical DC and AC Characteristics

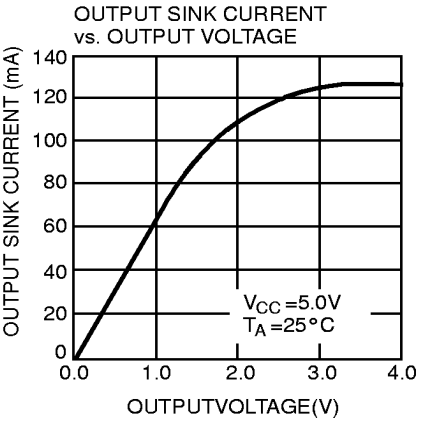


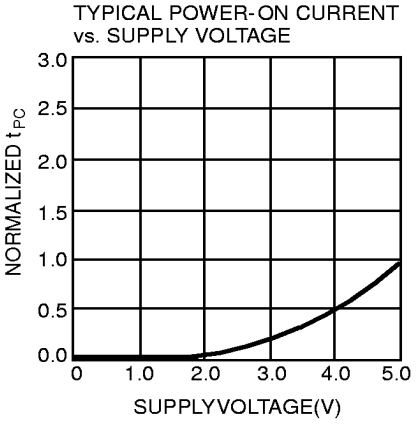


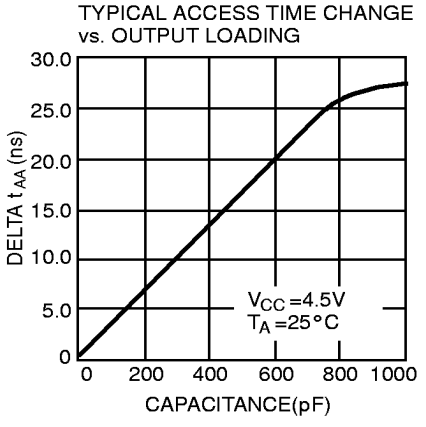


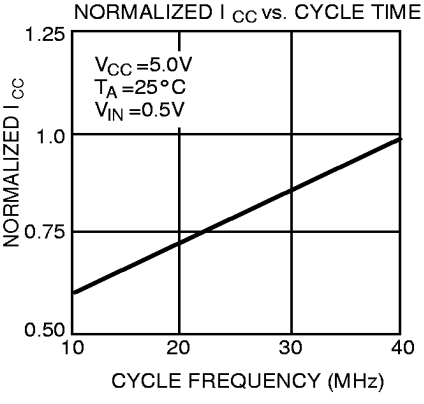












Ordering Information

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
30	CY7C132-30PC	P25	48-Lead (600-Mil) Molded DIP	Commercial
	CY7C132-30PI	P25	48-Lead (600-Mil) Molded DIP	Industrial
35	CY7C132-35PC	P25	48-Lead (600-Mil) Molded DIP	Commercial
	CY7C132-35PI	P25	48-Lead (600-Mil) Molded DIP	Industrial
	CY7C132-35DMB	D26	48-Lead (600-Mil) Sidebraze DIP	Military
45	CY7C132-45PC	P25	48-Lead (600-Mil) Molded DIP	Commercial
	CY7C132-45PI	P25	48-Lead (600-Mil) Molded DIP	Industrial
	CY7C132-45DMB	D26	48-Lead (600-Mil) Sidebraze DIP	Military
55	CY7C132-55PC	P25	48-Lead (600-Mil) Molded DIP	Commercial
	CY7C132-55PI	P25	48-Lead (600-Mil) Molded DIP	Industrial
	CY7C132-55DMB	D26	48-Lead (600-Mil) Sidebraze DIP	Military

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
15	CY7C136-15JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C136-15NC	N52	52-Pin Plastic Quad Flatpack	
25	CY7C136-25JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C136-25NC	N52	52-Pin Plastic Quad Flatpack	
30	CY7C136-30JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C136-30NC	N52	52-Pin Plastic Quad Flatpack	
	CY7C136-30JI	J69	52-Lead Plastic Leaded Chip Carrier	Industrial
35	CY7C136-35JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C136-35NC	N52	52-Pin Plastic Quad Flatpack	
	CY7C136-35JI	J69	52-Lead Plastic Leaded Chip Carrier	Industrial
	CY7C136-35LMB	L69	52-Square Leadless Chip Carrier	Military
45	CY7C136-45JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C136-45NC	N52	52-Pin Plastic Quad Flatpack	
	CY7C136-45JI	J69	52-Lead Plastic Leaded Chip Carrier	Industrial
	CY7C136-45LMB	L69	52-Square Leadless Chip Carrier	Military
55	CY7C136-55JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C136-55NC	N52	52-Pin Plastic Quad Flatpack	
	CY7C136-55JI	J69	52-Lead Plastic Leaded Chip Carrier	Industrial
	CY7C136-55LMB	L69	52-Square Leadless Chip Carrier	Military

Shaded area contains preliminary information.

Ordering Information (continued)

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
30	CY7C142-30PC	P25	48-Lead (600-Mil) Molded DIP	Commercial
	CY7C142-30PI	P25	48-Lead (600-Mil) Molded DIP	Industrial
35	CY7C142-35PC	P25	48-Lead (600-Mil) Molded DIP	Commercial
	CY7C142-35PI	P25	48-Lead (600-Mil) Molded DIP	Industrial
	CY7C142-35DMB	D26	48-Lead (600-Mil) Sidebraze DIP	Military
45	CY7C142-45PC	P25	48-Lead (600-Mil) Molded DIP	Commercial
	CY7C142-45PI	P25	48-Lead (600-Mil) Molded DIP	Industrial
	CY7C142-45DMB	D26	48-Lead (600-Mil) Sidebraze DIP	Military
55	CY7C142-55PC	P25	48-Lead (600-Mil) Molded DIP	Commercial
	CY7C142-55PI	P25	48-Lead (600-Mil) Molded DIP	Industrial
	CY7C142-55DMB	D26	48-Lead (600-Mil) Sidebraze DIP	Military

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
15	CY7C136-15JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C136-15NC	N52	52-Pin Plastic Quad Flatpack	
25	CY7C146-25JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C146-25NC	N52	52-Pin Plastic Quad Flatpack	
30	CY7C146-30JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C146-30NC	N52	52-Pin Plastic Quad Flatpack	
	CY7C146-30JI	J69	52-Lead Plastic Leaded Chip Carrier	Industrial
35	CY7C146-35JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C146-35NC	N52	52-Pin Plastic Quad Flatpack	
	CY7C146-35JI	J69	52-Lead Plastic Leaded Chip Carrier	Industrial
	CY7C146-35LMB	L69	52-Square Leadless Chip Carrier	Military
45	CY7C146-45JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C146-45NC	N52	52-Pin Plastic Quad Flatpack	
	CY7C146-45JI	J69	52-Lead Plastic Leaded Chip Carrier	Industrial
	CY7C146-45LMB	L69	52-Square Leadless Chip Carrier	Military
55	CY7C146-55JC	J69	52-Lead Plastic Leaded Chip Carrier	Commercial
	CY7C146-55NC	N52	52-Pin Plastic Quad Flatpack	
	CY7C146-55JI	J69	52-Lead Plastic Leaded Chip Carrier	Industrial
	CY7C146-55LMB	L69	52-Square Leadless Chip Carrier	Military

Shaded area contains preliminary information.

MILITARY SPECIFICATIONS

Group A Subgroup Testing

DC Characteristics

Parameter	Subgroups
V_{OH}	1, 2, 3
V_{OL}	1, 2, 3
V_{IH}	1, 2, 3
V_{IL} Max.	1, 2, 3
I_{IX}	1, 2, 3
I_{OZ}	1, 2, 3
I_{CC}	1, 2, 3
I_{SB1}	1, 2, 3
I_{SB2}	1, 2, 3
I_{SB3}	1, 2, 3
I_{SB4}	1, 2, 3

Switching Characteristics

Parameter	Subgroups
READ CYCLE	
t_{RC}	7, 8, 9, 10, 11
t_{AA}	7, 8, 9, 10, 11
t_{ACE}	7, 8, 9, 10, 11
t_{DOE}	7, 8, 9, 10, 11
WRITE CYCLE	
t_{WC}	7, 8, 9, 10, 11
t_{SCE}	7, 8, 9, 10, 11
t_{AW}	7, 8, 9, 10, 11
t_{HA}	7, 8, 9, 10, 11
t_{SA}	7, 8, 9, 10, 11
t_{PWE}	7, 8, 9, 10, 11
t_{SD}	7, 8, 9, 10, 11
t_{HD}	7, 8, 9, 10, 11
BUSY/INTERRUPT TIMING	
t_{BLA}	7, 8, 9, 10, 11
t_{BHA}	7, 8, 9, 10, 11
t_{BLC}	7, 8, 9, 10, 11
t_{BHC}	7, 8, 9, 10, 11
t_{PS}	7, 8, 9, 10, 11
t_{WINS}	7, 8, 9, 10, 11
t_{EINS}	7, 8, 9, 10, 11
t_{INS}	7, 8, 9, 10, 11
t_{OINR}	7, 8, 9, 10, 11
t_{EINR}	7, 8, 9, 10, 11
t_{INR}	7, 8, 9, 10, 11
BUSY TIMING	
t_{WB}[25]	7, 8, 9, 10, 11
t_{WH}	7, 8, 9, 10, 11
t_{BDD}	7, 8, 9, 10, 11

Note:
25. CY7C142/CY7C146 only.

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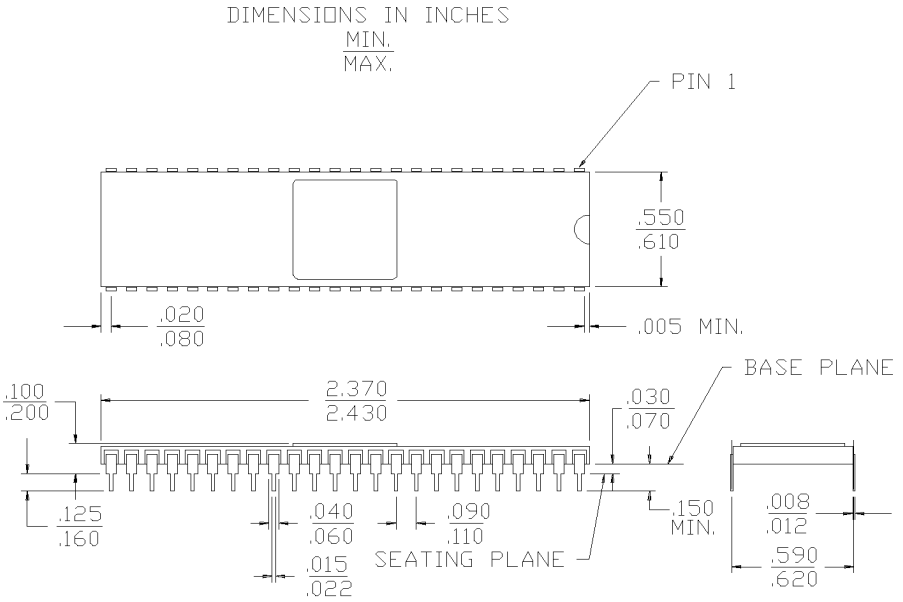
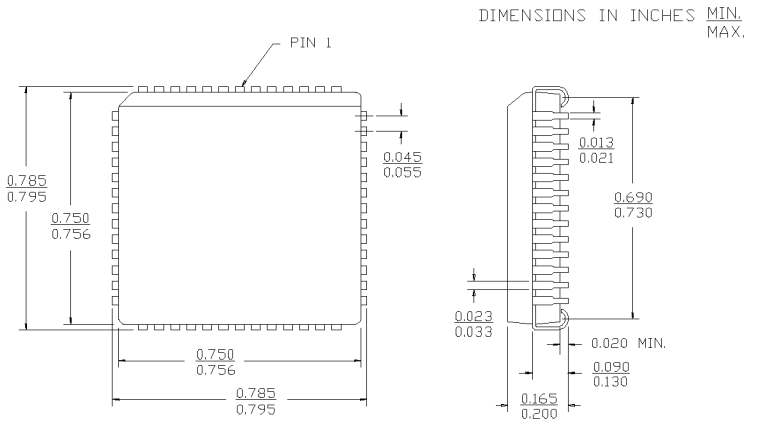
Package Diagrams

48-Lead (600-Mil) Sidebraze DIP D26

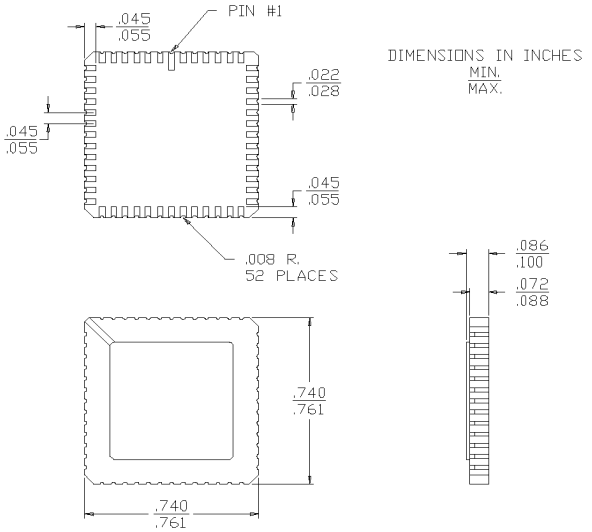


52-Lead Plastic Leaded Chip Carrier J69

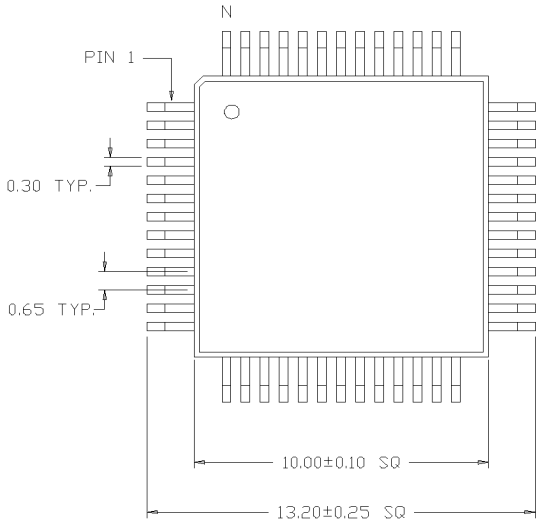


Package Diagrams (continued)

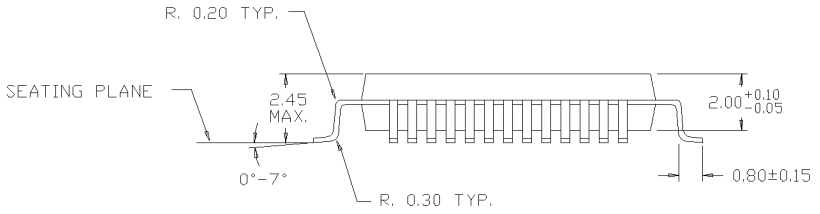
52-Square Leadless Chip Carrier L69



52-Lead Plastic Quad Flatpack N52



DIMENSIONS ARE IN MILLIMETERS
LEAD COPLANARITY 0.102 MAX.



Package Diagrams (continued)

48-Lead (600-Mil) Molded DIP P25